

Remarks

Currently pending in the application are claims 16-30. Claims 16 and 30 have been amended to further define the present invention. Support for the amendments can be found at, for example, paragraph [0050] of the published application. No new matter has been added. In view of the amendments above and following remarks, Applicants respectfully request reconsideration by the Examiner, and advancement of the application to allowance.

35 U.S.C. § 103

The Examiner has rejected claims 16-28 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Maekawa et al. (US 2002/0040098) in view of Eichorst et al. (US 2001/0019813). The Examiner has also rejected dependent claim 29 under 35 U.S.C. § 103(a) as being unpatentable over Maekawa et al. (US 2002/0040098) in view of Eichorst et al. (US 2001/0019813) and further in view of Wulf Von Bonin (US 3,827,869). Applicants traverse these rejections for the following reasons.

As amended, independent claims 16 and 30 of the present application recite a composition and method for forming a non-isocyanate based polyurethane polymer. The composition and method are based on the combination of three elements: (a) one or more polymerisable organic materials having at least one cyclocarbonate group; (b) at least one nano-clay having a platelet thickness of less than 25 Å and an aspect ratio higher than 10 or a nanocomposite formed from the nano-clay; and (c) at least one hardener.

In comparison, Maekawa et al. teaches a composition which combines (i) a block copolymer comprising one polymer block containing olefin monomer units and one polymer block containing units derived from vinyl monomers dispersed in an aqueous

solution of a basic substance with (ii) an isocyanate based polyurethane. *See Maekawa et al.* at paragraphs [0038]-[0040]. Maekawa et al. further teaches that a crosslinkable set of functional groups, such as epoxy and carboxyl groups, may be introduced into both (i) the block copolymer and (ii) isocyanate based polyurethane. However, Maekawa et al. does not teach or suggest substituting the isocyanate based polyurethane with a non-isocyanate based polyurethane.

The Examiner has added Eichorst et al. for teaching sulfonated polyurethanes having dispersed therein clay platelets of a certain thickness and diameter. However, the sulfonated polyurethanes taught in Eichorst et al. are also produced from isocyanates. *See Eichorst et al.* at paragraph [0044]. Eichorst et al. neither teaches nor suggests that sulfonated isocyanate based polyurethanes could be substituted with sulfonated non-isocyanate based polyurethanes or that dispersing clay platelets in a sulfonated non-isocyanate based polyurethane would even be successful in an imaging element or for that matter, any application.

Nevertheless, Applicants surprisingly found that environmentally damaging isocyanates can be avoided in forming a non-isocyanate polyurethane material having beneficial physicochemical and mechanical properties, such as the avoidance of occluded gas bubbles. *See US 2007/0135588* at paragraphs [0048] and [0051].

Moreover, Applicants surprisingly found that by combining (a) one or more polymerisable organic materials having at least one cyclocarbonate group with (b) at least one nano-clay having a platelet thickness of less than 25 Å and an aspect ratio higher than 10 or a nanocomposite formed from the nano-clay; and (c) at least one hardener, a non-isocyanate based polyurethane material can be produced having superior physical and

mechanical properties as compared to material that does not contain nano-clay. In particular, as demonstrated in Tables 5, 6 8, 9 and 10 and Examples 35-36 of the present application, the incorporation of nano-clay into the non-isocyanate polyurethane material of the present invention can, in comparison to material which does not contain nano-clay: significantly reduce gel time and water uptake; increase the glass transition temperature and lap shear strength; and, reduce deformation. This is neither taught nor suggested in the publications cited above nor was it expected by the Applicants. Accordingly, Applicants submit that claims 16 and 30, and all claims depending on claims 16 and 30, are not obvious in view of the publications cited above and respectfully request the rejections under 35 U.S.C. § 103(a) be withdrawn.

Conclusion

Applicants respectfully submit that the application is now in condition for allowance, and respectfully request an issuance of a Notice of Allowance directed towards the pending claims.

Should any fee be due in connection with the filing of this document, the Commissioner for Patents is hereby authorized to deduct said fee from Huntsman Corporation Deposit Account No. 08-3442.

Respectfully Submitted,

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